Binary Parallel Adder:-

For two numbers of two bits, two adders are needed and for three bits numbers, three adders are needed and so on. The carry of each adder is connected to the carry input of the next heigher order adder.

Ex:- The two bit binary paralled adder is shown below.

Solution:- Let $A = A_1 \, A_0$ (MSB ↘ A_1, LSB ↙ A_0)

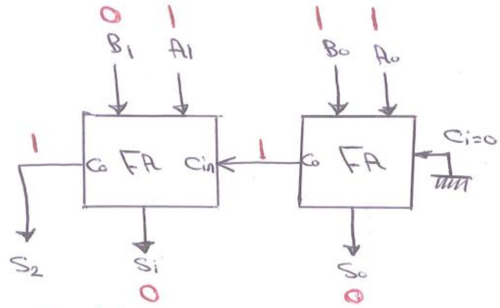
$B = B_1 \, B_0 \; +$ (MSB ↘ B_1, LSB ↙ B_0)

Result $= S_2 \; S_1 \; S_0$

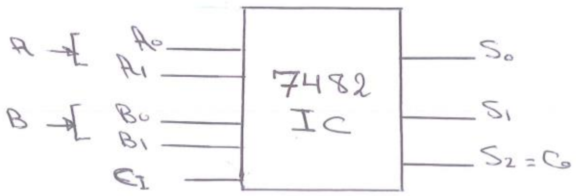
C_{in} = Carry input to LSB

C_o = Carry output to MSB

$$\begin{array}{r} ① \\ A = 11 \\ B = 01 + \\ \hline 100 \end{array}$$



Note:- Two bit binary parallel adder 7482 IC



A_0, B_0 → (LSB input)

A_1, B_1 → (MSB input)

CI → (Carry input to the LSB)

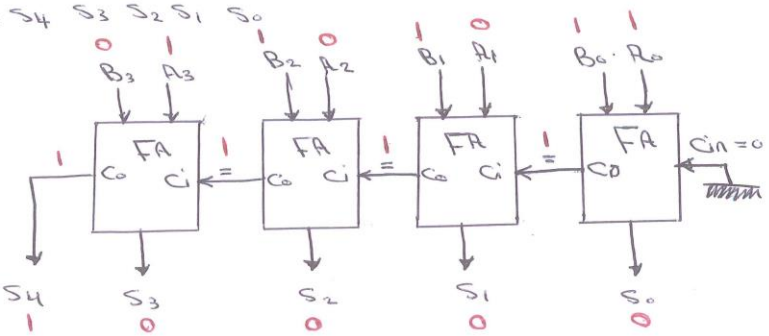
Co → (Carry output to the MSB).

Ex:- The four bit binary parallel adder is shown below:-

Solution:- Let $A = A_3 A_2 A_1 A_0$ (msB → LsB)

$B = B_3 B_2 B_1 B_0$ +

Result = $S_4\ S_3\ S_2\ S_1\ S_0$

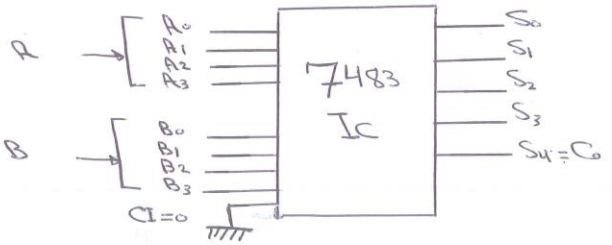


A = 1001

B = 0111 +

10000

Note:- Four bit binary parallel adder 7483 Ic



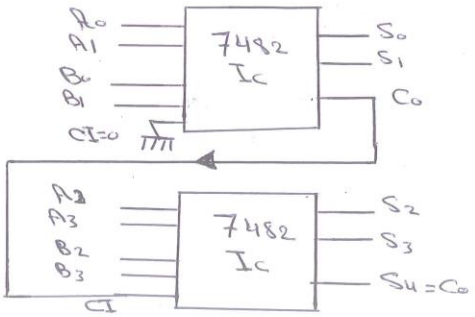
Ex:- Show how you can obtain Four bit adder from Ic of 7482 only:-

Solution:-

A = $A_3 A_2 A_1 A_0$

B = $B_3 B_2 B_1 B_0$

$S_4 S_3 S_2 S_1 S_0$



H.w:- Design 8-bits adder by using block diagram of IC 7483 (4-bit) adder.

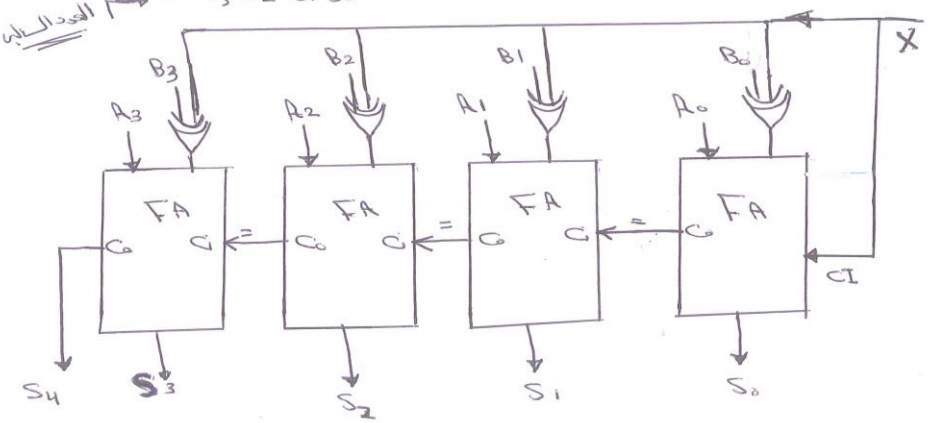
H.w:- Use Full adder block diagram of IC 7483 to convert BCD to Ex-3 code.

Adder / Subtractor:-

Ex:- Design an Adder/subtractor cct. using FA's and gates:-

Solution:- $A = A_3 A_2 A_1 A_0$

$B = B_3 B_2 B_1 B_0$ العدد الثاني



X=0 in Adding operation and output result = $S_4 S_3 S_2 S_1 S_0$

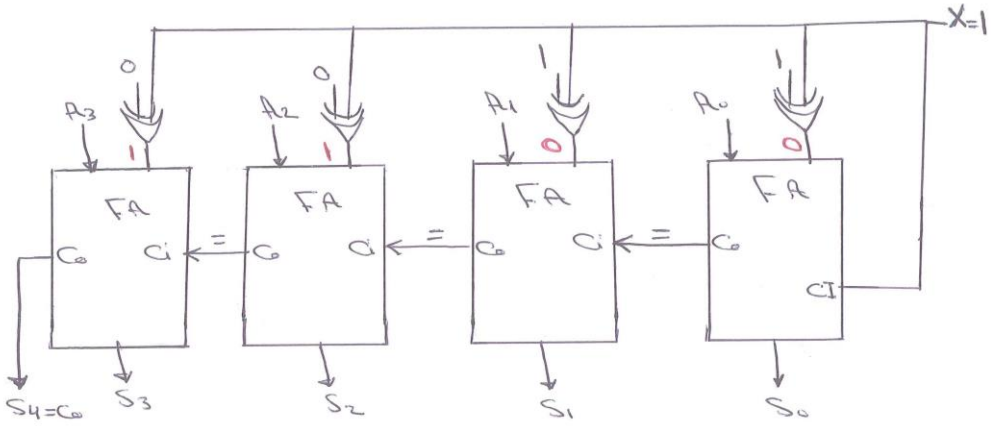
X=1 in Subtraction operation and output result equal $S_3 S_2 S_1 S_0$ and S_4 or C_0 will be (discarded) due to 2's complement operation.

Ex:- Using an Adder/subtractor cct. to convert from Ex-3 code to BCD code:-

Solution:- Let $A = A_3 A_2 A_1 A_0$ in Ex-3 code

Then BCD number = $A_3 A_2 A_1 A_0$

0 0 1 1 -



H.w:- Using an adder/subtractor cct. to convert from BCD code to Ex-3 code?